

10/539510

SEPPO E. LAINE
CHRISTOFER SUNDMAN
JARI LIPSANEN
SIMO HOVI
SISKO KNUTH-LEHTOLA
JARKKO TILIKAINEN
YRKI NIINISIEN
OM-ERIK HAGELBERG
PIA ANTINEN
SOLVEIG STRÖMSHOLM

European Patent Office
D-80298 Munich
Germany

November 4, 2004

VIITTEENNE:
YOUR REFERENCE:

BY FACSIMILE (4 pages)

VIITTEEMME:
OUR REFERENCE:

METSO8PCT
P2014PC00

Dear Sirs,

Re: International PCT Application No. PCT/FI2004/000005
In the name of METSO PAPER, INC.
Our reference: METSO8PCT

Referring to the communication of the International Searching Authority of 1 April 2004 we enclose following amendments and remarks according to Rule 43bis.1(c).

Amendments:

We enclose new pages 10 and 11 that replace corresponding earlier pages. New claims 1 and 11 replace earlier corresponding claims. No new matter has been added.

The independent claims 1 and 11 are amended to more clearly show that the water (liquid) injected to the steam atmosphere is heated before injection to said atmosphere. The amendment is based on page 2, lines 20 and 22 and reformulation of the wording of the claim.

Remarks:

The purpose of the invention is to accomplish a way to inject hot water or other treating liquid on a paper or cardboard web. As described in the specification of this application, this cannot be accomplished in ambient temperature. D1, US 6,248,407, discloses a method for application of coating spray on a web in a steam atmosphere. It is clear that the water in the coating mix is heated in the steam atmosphere. However, according to the invention the liquid injected into the steam atmosphere has to be already heated when entering the steam atmosphere. This is essential because large amounts of cold water sprayed in fine droplets into a steam atmosphere would cool the heated space radically, which would inevitably cause a risk for condensation of the liquid and formation of big droplets which could destroy the surface of the web. D1 does not disclose use of heated liquid.

SEPPO LAINE OY

PL 339 P.O.B. 339
00181 HELSINKI, FINLAND

TOIMISTO OFFICE
ITÄMERENKATU 3 B
00180 HELSINKI, FINLAND

* SUOMEN PATENTTIASIAMIESYHDISTYS
RY:N JÄSEN

* MEMBER OF FICPI
○ MEMBER OF EPI
□ OHIM REPRESENTATIVE



PUHELIN

NAT. 09-68 59 560

INT. + 358 - 9-68 59 560

FAX + 358 - 9-68 595610

PHONE

09-68 59 560

+ 358 - 9-68 59 560

+ 358 - 9-68 595610

PANKIT

NORDEA

BANKERS

215318 - 60138

SWIFT (BIC): NDEAFIHH

IBAN: FI62 2153 1800 0601 38

SAMPO 800018 - 1108516

SWIFT (BIC): PSPBFIHH

IBAN: FI80 8000 1801 1085 16

SÄHKÖPOSTI
seppo.laine@seppolaine.fi

Since the use of heated liquid is not disclosed, the invention described in the amended claims is novel. Further, the cited reference D1 does not include a solution to the condensation problem when heated water is to be sprayed on a web. For this reason the invention includes inventive step.

On the basis of the above presented reasons it is respectfully solicited that the invention defined in the present claims be considered novel and inventive whereby we hope that a positive preliminary examination report can be issued.

Yours faithfully,

Simo Hovi
European Patent Attorney

What is claimed is:

1. A method for moistening a web of paper or paperboard, the method comprising the step of forming a steam atmosphere into a steam blow cavity open toward the web (1) by way of feeding steam into the cavity, **characterized** applying a spray of liquid heated to a temperature higher than the ambient temperature from at least one nozzle onto the web in the steam atmosphere.
5
2. The method of claim 1, **characterized** in that the temperature of the liquid applied as a spray is particularly advantageously in the range of 70 – 95 °C.
10
3. The method of claim 1, **characterized** in that the temperature of the liquid applied as a spray is in the range of 30 – 99 °C.
15
4. The method of claim 1, 2 or 3, **characterized** in that the steam and the liquid required for establishing the steam atmosphere are injected from the same nozzle.
20
5. The method of claim 1, 2 or 3, **characterized** in that the steam and the liquid required for establishing the steam atmosphere are injected from separate nozzles.
25
6. The method of any one of foregoing claims, **characterized** in that into the cavity open toward the web is formed an atmosphere of saturated steam.
30
7. The method of any one of foregoing claims, **characterized** in that the steam is water vapor and the liquid is water.
25
8. The method of any one of foregoing claims, **characterized** in that the temperature of the liquid being applied as a spray is controlled in the cross-machine (CD) direction.
30
9. The method of any one of foregoing claims, **characterized** in that the amount of

the liquid being applied as a spray is controlled in the cross-machine (CD) direction.

10. The method of any one of foregoing claims 8 - 9, **characterized** in that the temperature or flow rate of the liquid being applied as a spray is adjusted in the cross-machine (CD) direction with the help of a control system and measurements performed on the web.
11. An assembly for moistening a web of paper or paperboard, the assembly comprising a steam blow cavity adapted to open toward a moving web (1) and at least one nozzle (5, 6, 7) for feeding at least steam into the steam blow cavity so as to form a steam atmosphere, **characterized** by at least one nozzle (5, 6, 7) for applying a spray of a liquid heated to a temperature higher than the ambient temperature onto the web (1) in the steam atmosphere.
- 15 12. The assembly of claim 11, **characterized** in that that at least one of the nozzles is a dual-channel nozzle (FIG. 4) capable of injecting both steam and liquid.
13. The assembly of claim 11, **characterized** by the use of separate nozzles for injecting steam and liquid.
- 20 14. The assembly of any one of claims 11 - 13, **characterized** by means adapted to the nozzles for heating the injected therefrom and controlling the temperature of the injected liquid.
- 25 15. The assembly of any one of claims 11 - 14, **characterized** in that the assembly is located on the dryer section, calender or therebetween of a paper/paperboard manufacturing line.